Comparison of Demographic Data between Fathers with and without Paternal Postpartum Depression, Especially during the Covid-19 Pandemic

Thesis

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Abstract

In recent years, more and more attention has been paid to paternal postpartum depression (PPD). In order to better understand paternal PPD, this study was to determine whether there were statistically significant differences in participants' demographics and responses to COVID-19 related questions between fathers with and without PPD, and also explored the impact of the COVID-19 pandemic on paternal PPD. This study was a quantitative survey study and used SPSS conducting chi-square tests and frequency analysis to get results. It recruited participants and distributed survey through Amazon Mechanical Turk. Findings of the study showed that there were statistically significant differences between PPD father group and non-PPD father group among 1) participant's age 2) participant's sexual orientation; 3) whether participants have been employed full-time; 4) participant's ability to pay rent; 5) whether participant's partner has been diagnosed with PPD; 6) whether participant's relationship with their partner has been changed because of the birth of their infant. As for factors related to COVID-19 pandemic, statistically significant differences between two group were found among 1) participant's COVID-19 test results 2) whether participants have been hospitalized for COVID-19; 3) whether participants have been self-isolated for COVID-19; 4) whether participant's relationship with their partner has been changed because of COVID-19; 5) how participants thought COVID-19 impact their mental health. Most of the participants (n=205) thought that COVID-19 pandemic negatively impacted their financial ability, social life, ability to seek help, and mental health. However, 52.19% of the participants thought that COVID-19 positively influenced their experience of being a father.

Keywords: paternal postpartum depression, male mental health, demographic data, COVID-19 pandemic

Dedication

This study is dedicated to fathers experiencing paternal postpartum depression and their families. I hope this study could let more mental health professionals support, encourage, and advocate for fathers with paternal postpartum depression.

Acknowledgments

I would like to thank Dr. Mo-Yee Lee for her great help and guidance in my research. I would like to thank Ms. Jennie Babcock. Her constant encouragement has given me confidence that I can succeed in my study. I would like to thank my field instructors, Alicia Gregory and Kristen Alsept. They gave me a lot of useful advice for my study. I would also like to thank OSU college of social work for having this excellent honor program and all the teachers who taught and helped me during my study at OSU. They have taught me how to become a good social worker and researcher. Finally, special thanks to my best parents in the world. Their love makes me thrive.

Chapter 1 Introduction

In 1968, Pitt·B first proposed the concept of postpartum depression in his article *"Atypical" expression following childbirth* published in the British Journal of Psychiatry (Pitt,1968). After that, people pay more and more attention to postpartum depression, especially for mothers of infants. But now, more and more studies have shown that fathers of infants may also be at risk for postpartum depression (PPD).

Paternal Postpartum Depression

Nowadays, there is no single official set of criteria for the diagnosis of paternal PPD. The diagnosis of paternal PPD is mainly based on measures developed for maternal PPD. In the Diagnostic and Statistical Manual of Mental Disorders-5 (DSM–5), the depressive disorder with peripartum onset is defined as a major depressive episode occurring during pregnancy or in the 4 weeks following deliveries (American Psychiatric Association (APA), 2013). Women with peripartum major depressive episodes often have severe anxiety and even panic attacks. (APA, 2013). Patients with postpartum depression may have psychotic features or may not. Serious patients with psychotic features may have hallucinations, delusions, or even infanticide tendencies (APA, 2013). In addition, people with the following symptoms should also be noted that they are at risk of postpartum depression. The common symptoms of mild postpartum depression are depressed mood or severe mood swings; excessive crying; difficulty bonding with your baby; withdrawing from family and friends; loss of appetite or eating much more than usual; insomnia or sleeping too much; overwhelming fatigue or loss of energy; reduced interest and pleasure in activities; intense irritability and anger; fear that they are not a good parent; hopelessness; feelings of worthlessness, shame, guilt or inadequacy; diminished ability to think

clearly, concentrate or make decisions; restlessness; recurrent thoughts of death or suicide (APA, 2020).

Although there are many similarities between maternal and paternal PPD, we cannot assume that criteria to diagnose maternal PPD are applicable to paternal PPD because there are still differences between them. For example, studies have shown that paternal PPD can occur later and more gradually within a year after the birth of the infant (as cited in Kim & Swain, 2007), so it does not apply to the maternal PPD criterion that PPD occurs within one month after delivery (APA, 2013). Fathers' depressive symptoms are often less apparent than mothers', while women tend to show more "classical" symptoms of depression, such as strong sadness and crying; fathers may be more likely to withdraw from social situations or appear irritable and indecisive (Letourneau et al., 2012). At present, there are little researches to show whether paternal PPD is accompanied by psychotic features, whether it can also produce hallucinations and delusions, and increase the risk of infanticide. However, during the postpartum period, the most common psychiatric disorders co-occurring with depression are anxiety and obsessive-compulsive disorder (OCD). Studies show that around 10 percent of fathers reported a significant elevation of anxiety levels when transitioning to parenthood (Kim & Swain, 2007). Besides, fathers with PPD are also likely to suffer from OCD. Typical symptoms of postpartum OCD include intrusive thoughts and/or compulsive behaviors, which may harm their children.

Prevalence of Paternal Postpartum Depression

During the first postpartum year, paternal depression incidence ranged from 1.2% to 25.5% among US community-based samples (Goodman, 2004; Kim & Swain, 2007). The incidence rate is relatively higher in the 3- to the 6-month postpartum period (Paulson & Bazemore, 2010). The postpartum depression of fathers applies to fathers all over the world.

Internationally, the rate of paternal postpartum depression ranges from 1.2 % (Ireland) to 11.9 % (Brazil) (as cited in Kim & Swain, 2007). Although there are different standards or definitions of paternal PPD in different countries, paternal PPD does affect many infant fathers' mental health to some extent. Due to the stigmatization of mental illness in some cultures, some fathers may not seek help, and many paternal PPD cases may be underreported (Stewart et al., 2003). The prevalence of PPD in fathers of infants may be more severe than studies have shown.

Factors Related to Paternal Postpartum Depression

In a family, if the mother of an infant is diagnosed with postpartum depression, the father is more likely to be diagnosed with PPD. In Goodman's study (2004), as many as 24% to 50% of men whose partners have PPD may also experience depression, making maternal PPD one of the strongest predictors of paternal PPD. The prevalence of paternal PPD increases as the severity of maternal symptoms increases (Pinheiro et al., 2006).

Currently, the possible causes of paternal PPD may due to biological and ecological changes. From a biological point of view, paternal PPD may be associated with previous depression history (Ayinde & Lasebikan, 2019) and hormonal changes (Kim & Swain, 2007). Some hormonal changes could help fathers better raise their children, enhance parent-infant binding, or better protect their children (Kim & Swain, 2007). Fathers with PPD may have testosterone level changes, lower estrogen levels, lower cortisol levels, lower vasopressin levels, and prolactin levels changes (Kim & Swain, 2007). These hormones' changes will have an emotional impact on fathers, and lack of several hormones' secretion will make it difficult for infant fathers to adapt to their new role as a new father. However, the research on biological factors of father's postpartum depression is limited, and further research is still needed.

Another risk factor of paternal PPD is ecological factors. According to the person-in-environment theory of social work (Kondrat, 2013), when we consider the risk factors of paternal PPD, we must consider the environment of the father of the infant. From the ecological model (Bronfenbrenner, 1979), we can know that, due to an infant's arrival, an infant's father's environment has greatly changed from different levels, such as family, community, work, society, or even culture. The new fathers will face more demands and responsibilities than before because of the environment changes, which puts some fathers at a higher risk of PPD.

Within the new fathers' microsystem, the relatively slow development of attachment with infants, poor interactions with infants, and lack of parenting rewards is all the possible factors leading to paternal PPD (Kim & Swain, 2007). Other factors that lead to paternal PPD for many fathers is the absence of a good role model (Kim & Swain, 2007). Many fathers report that they are do not learn appropriate parenting skills from their fathers or other male elders. And right now, with the significant increase in social expectations for more involvement of fathers in parenting, a lack of understanding of fathers' expectations can lead to anxiety and a greater risk of paternal PPD in fathers (Kim & Swain, 2007).

Also, the change of family structure and relationship with their partners are risk factors of PPD. Results revealed higher PPD symptoms among men with fewer children (Roubinov et al., 2014), especially for the first-time father. These father's family structure and daily life have changed greatly. And greater depressive symptoms were also observed among fathers if they have poorer relationship satisfaction during the prenatal period in a Mexican study (Roubinov et al., 2014).

Besides, it is worth noting that many fathers are the financial pillar of the family. With the arrival of the new baby, the father's financial pressure will also increase, which may reduce

the father's parenting efforts, and it may increase the distance between father and children (Kim & Swain, 2007). A British study also showed that paternal depressive symptoms were consistently associated with fathers' unemployment and socioeconomic factors such as rented housing and low family income (Nath et al., 2016).

From a Macrosystem cultural perspective, a Mexican study has shown that lower orientation to Anglo culture predicted higher paternal PPD symptoms (Roubinov et al., 2014). For fathers in other cultures, further research is needed.

Paternal Postpartum Depression Effects

It is necessary to study the paternal PPD because it not only directly affects the father's mental health but also affects the overall function of the family and children and mothers in the family. The father's anxiety and depression may translate into violent behaviors toward his partner (Kim & Swain, 2007). The low supports from fathers who experience PPD may cause a mother to become more vulnerable to stress and psychopathology (Kim & Swain, 2007). Research also shows that fathers with depressive symptoms harm the quality of father-infant interaction, and the interaction between father and child is closely related to the child's social competencies (Letourneau et al., 2012). Compared with non-depressed fathers, depressed fathers showed less warmth and more psychological control (Letourneau et al., 2012). A father who experienced PPD might fail to build a secure attachment with his infant child, which may negatively affect the infant's development. Children with fathers experiencing PPD tend to exhibit greater emotional and behavioral problems at later ages, such as conduct problems or hyperactivity (Kim & Swain, 2007). At present, based on the knowledge of researcher in this study, there is no study on the influence of paternal postpartum depression on siblings in the family.

COVID-19 Pandemic

Due to the timing of the study, we have to consider the impact of COVID-19 on the study. 2020 and 2021 are challenging years. COVID-19 pandemic affects almost all over the world. The first U.S. COVID-19 case was confirmed in Washington State on January 20, 2020 (Harcourt et al., 2020). Since then, more and more cases have appeared. By the end of April, according to the Centers for Disease Control and Prevention's data (CDC, 2021), there have been more than 31 million cases and nearly 0.57 million deaths in the United States. COVID-19 pandemic has greatly affected people's lives in terms of economy, mental health, etc. In July, the U.S. unemployment rate was 10.2% (U.S. Bureau of Labor Statistics, 2020) much higher than the 3.5% in February before the COVID-19 pandemic (U.S. Bureau of Labor Statistics, 2020). Many people lay off or unable to find jobs. In terms of people's mental health, a U.S. study showed that the prevalence of depression symptoms was more than 3-fold higher during COVID-19 than before the COVID-19 pandemic (Ettman et al., 2020). As we know that unemployment is a risk factor for paternal PPD, it is necessary to investigate how fathers were affected during the Covid-19 pandemic.

Chapter 2 Methodology

Research Design

This study adopted a cross-sectional survey design to explore the differences in demographic data of fathers with and without paternal postpartum depression, especially during the current COVID-19 pandemic. This study recruited participants and distributed study's survey through Amazon Mechanical Turk internationally. Eligible participants are fathers over 18 years old and their infants born after March 1st, 2020. The participants need to identify themselves as male. This study was a quantitative survey study that used SPSS for data analyses purposes. Participants were given a three-part online survey at one time. The study used chi-square tests to determine whether there were statistical differences in participants' demographics and responses to COVID-19 related questions between PPD father group and non-PPD father group. Participants who completed this study were awarded $0.50 as an incentive for participation.

Participants

This study recruited participants by convenience sampling. Participants in this study were recruited through Amazon Mechanical Turk. Amazon Mechanical Turk is "a forum where requesters post work as Human Intelligence Tasks (HITs) and workers complete these HITs in exchange for a reward." (Amazon Web Services, Inc., 2021) A common use for Amazon Mechanical Turk is that researchers post their surveys to collect data (Amazon Web Services, Inc., 2021). Because this study was to study the differences in demographics of fathers with and without PPD during the COVID-19 pandemic, the target participants were required to meet the following two main criteria: 1) participants considered themselves to be male and they were at least 18 years old 2) participants need to be a father of an infant born after March 1st ,2020 and their infants were less than one year old when they fill out the online survey. 292 new fathers

participated in the study, but only 205 surveys were valid. Qualified participants received a $0.50 award as they provided consent, completed survey, and followed the study's directions.

The participants were allowed to fill in the survey in the private location of their choosing. All information in this study was collected anonymously, and participants were also informed that their participation in this study was completely voluntary, and they can withdraw from the study at any time in the process of filling in the survey.

Measurements

This study's online survey includes 3 part (see study survey in Appendix 3). First part is Edinburgh Postnatal Depression Scale (EPDS). It was used to divided fathers into PPD father group and non-PPD father group. 10 was used as the cut-off score (Edmondson et al.,2010). The second part asked fathers their demographic characteristics. The third part asked fathers questions related to COVID-19 pandemic.

The Edinburgh Postnatal Depression Scale (EPDS) was used in this study to assess whether a father of an infant was experiencing paternal PPD. EPDS was first created by Scottish health centers in Edinburgh and Livingston in 1987 (Illinois Department of Healthcare and Family Services, n.d.) It has been widely proved suitable for mothers' perinatal depression screening and has good reliability and validity. The results of Edmondson et al. study also suggests that the EPDS is effective in screening paternal PPD (2010). EPDS consists of 10 self-report items, and each item is scored on a 4-point scale rating from 0-3 points according to the severity (Cox et al.,1987). After the participants answer each item, the researcher can add all the scores to get the final EPDS result. A score of greater than 10 was found to be the optimal cut-off point for screening for paternal PPD, with a sensitivity of 89.5% and a specificity of 78.2% (Edmondson et al., 2010). Suppose the participants' score is 0-10, the participant probably does

not have paternal PPD. If the participants' score is 11-30, the participant is likely to have paternal PPD.

In this study, except for the use of EPDS, participants' demographic data were also be collected, including age, gender, sexual orientation, ethnicity, religion, education, marital status, employment status during COVID-19 pandemic, household income in 2020, whether participants have been employed full-time, participant's ability to pay rent, whether participant's partner has been diagnosed with PPD, whether participant's relationship with their partner has been changed because of the birth of their infant, etc.

Additionally, due to the timing of this study, the United States was affected by the COVID-19 pandemic. Therefore, in the online survey, researchers asked participants questions about the impact of the COVID-19 on them. According to the CDC (2020), fear and worry about people's own health and the health of their loved ones, their financial situation or job, or loss of support services they rely on can lead to stress during an outbreak of an infectious disease. Based on that, the survey questions include: whether participants being tested positive for COVID-19, whether participants being hospitalized for COVID-19, whether participants being self-isolated for COVID-19, whether participants worried about being infected with COVID-19, whether participants worried about their infants being infected with COVID-19, whether participant's relationship with their partner has been changed because of COVID-19, and the impact of COVID-19 on their financial ability, social life, ability to ask for help, mental health, and experience of being a father, etc.

Data Analysis

This study data analysis was conducted by SPSS. The researcher first cleaned up data excluding invalid data, such as the incomplete survey and unqualified participant's survey. Then

the researcher calculated participants' EPDS scores according to their answers to the EPDS, and divided participants into PPD father group and non-PPD father group by using 10 as cut-off score. Participants' EPDS scores were also analyzed for their mode, mean and median.

The study used chi-square tests to determine whether there were statistical differences in participants' demographics and responses to COVID-19 related questions between PPD father group and non-PPD father group. The variables involved in the second and third parts of the survey are independent, which meets the null hypothesis of the chi-square test that there is no relationship exists on the categorical variables in the population. For different factors asked in the suvery, P-value < .05 was used in this study as the standard to judge whether there was a significant difference between PPD father group and non-PPD father group.

For questions asked participants the impact of COVID-19 on their financial ability, social life, ability to ask for help, mental health, and experience of being a father, frequency analysis was conducted.

To assure the participants' confidentiality, the survey's data was saved for one month after the study was completed, and then the data were deleted forever. During the study, no-identifiable electronic data were stored in researchers' password-protected computers. The computers were securely locked in rooms or cabinets. Files containing collected data were closed when computers were left unattended.

Institutional Review Board (IRB) Exempt

This study (Study# 2021E0098) was determined exempt for the IRB review by The Ohio State University Office of Responsible Research (see IRB exempt approval in Appendix 1). All informed consents were received before data collection (see study consent in Appendix 2).

Chapter 3 Results

In this study, a total of 292 surveys were received, including 205 valid ones.

EPDS Scores

Participants' Edinburgh Postnatal Depression Scale (EPDS) scores are between 0 and 28. The average EPDS scores of all participants is 13.84, the median is 15, the mode is 16, and the standard deviation is 5.662. The data distribution conforms to the normal distribution (Figure 1).

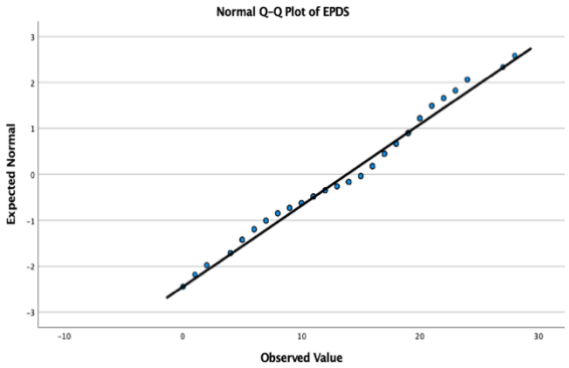

Figure 1 EPDS Scores Distribution

By using 10 as the cut-off point for paternal PPD, this study has 58 (28.29%) infants' fathers who probably did not have PPD and 147 (71.71%) infants' fathers likely had PPD (n=205). PPD fathers' average EPDS score is 16.77, while non-PPD fathers' average EPDS score is 6.43. The median of PPD fathers' EPDS score is 17, while the median of non-PPD fathers' EPDS score is 7. The mode of PPD fathers' EPDS score is 16, while the mode of non-PPD fathers' EPDS score is 7. (Table 1)

Table 1 EPDS Scores — PPD Father vs. Non-PPD Father

	Total	Mean	Median	Mode
PPD Father EPDS>10	147 (71.71%)	16.77	17	16
Non-PPD Father EPDS<=10	58 (28.29%)	6.43	7	7
All Participants	205	13.84	15	16

Demographic Characteristics

Participants in this study were between the ages of 18 and 62. The number of participants aged 30 to 39 was the largest, with 109 people, accounting for 54.5% of the total number of participants (n=200), followed by those aged 20 to 29, with 61 people, accounting for 30.5% of

the total number of participants (n=200). Before COVID-19 (March 1st, 2020), 91.22% of participants (n=205) considered their physical health either very good or good (Figure 2), and 83.9% of participants (n=205) considered their mental health either very good or good (Figure 3). The majority of participants' infants were 6 months old, accounting for 16.6% (n=205), the second was 10 months old, accounting for 10.7%(n=205), and the third was 3 months old, accounting for 9.8%(n=205) (Figure 4). The most of infants born during COVID-19 pandemic were the second children of the participants. 51.7% (n=205) of the participants had their second child born during COVID-19 pandemic (Figure 5).

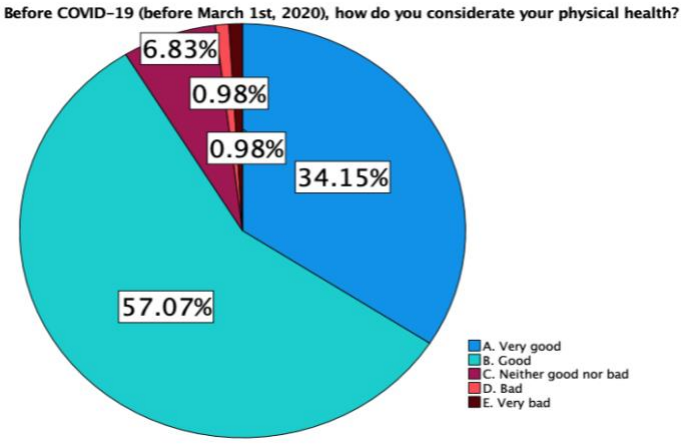

Figure 2 Participant's Physical Health before COVID-19

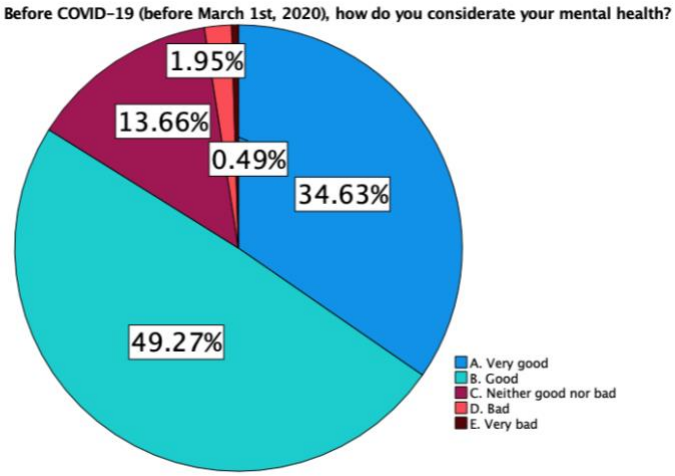

Figure 3 Participant's Mental Health before COVID-19

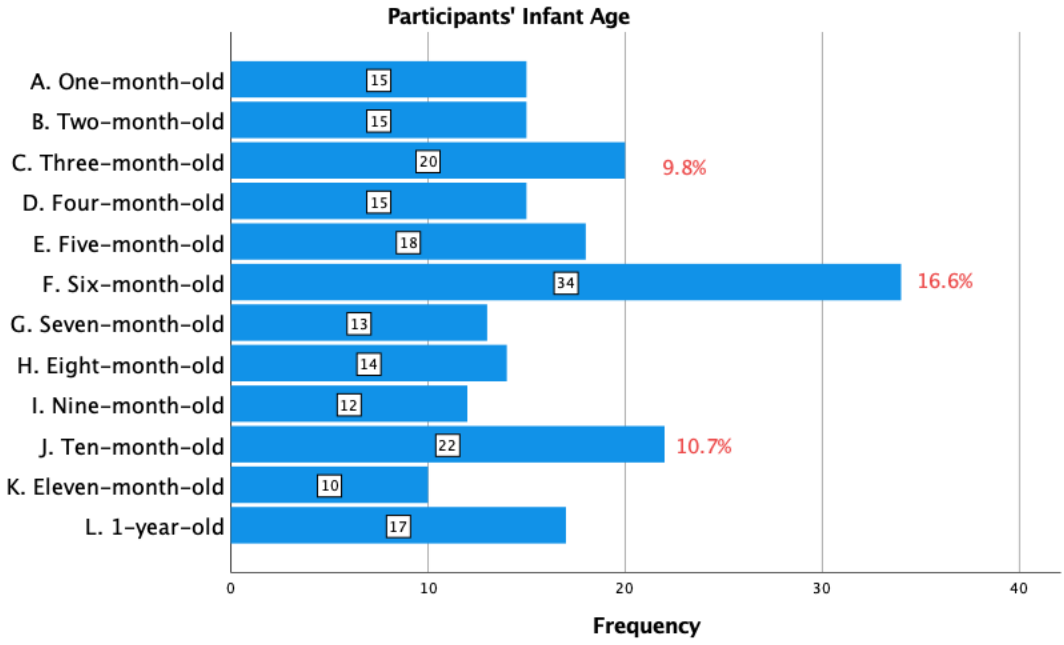

Figure 4 Participant's Infant Age

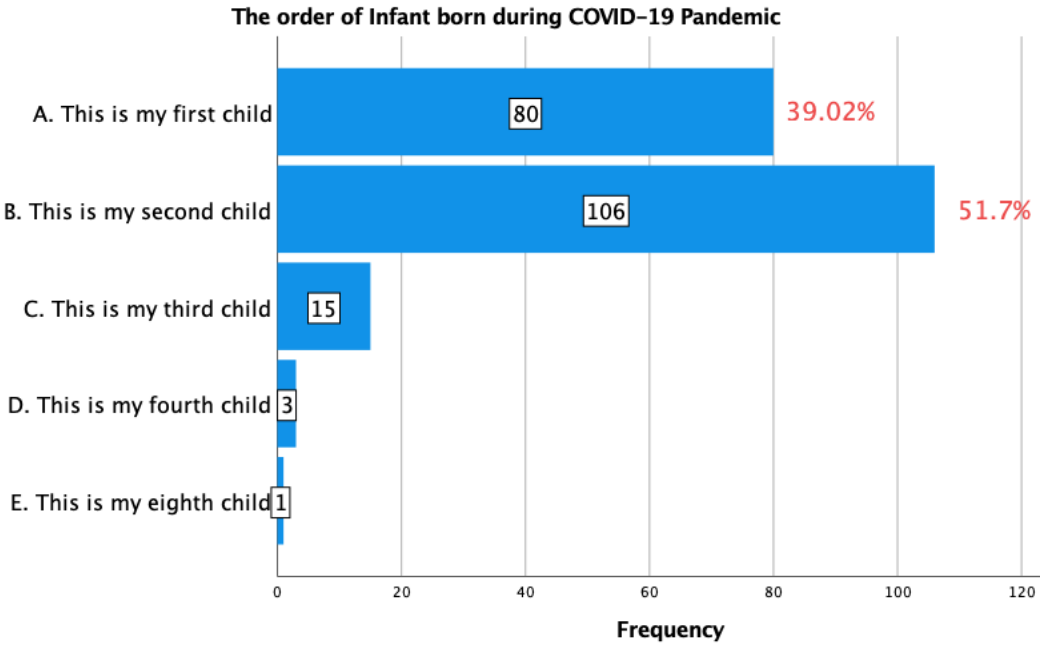

Figure 5 The Order of Infant Born During COVID-19

In this group of participants, statistically significant differences between PPD father group and non-PPD father group were found among 1) participant's age; 2) participant's sexual orientation; 3) whether participants have been employed full-time (40+hours a week); 4) participant's ability to pay rent; 5) whether participant's partner has been diagnosed with PPD; 6) whether participant's relationship with their partner has been changed because of the birth of their infant. (Table 2)

Compared with P-value .05, P-value of PPD father group and non-PPD father group on age (χ^2=12.105, p=.002) is less than .05. Therefore, there was a statistically significant difference on paternal PPD among different father's age groups. New fathers aged 20-29 were associated with a higher risk of PPD. Father's age could have a weak to moderate size effect on PPD (Cramer's V =.250).

The risk of paternal PPD was different between new fathers with different sexual orientation. P-value of PPD father group and non-PPD father group on sexual orientation (χ^2=7.829, p=.005) is less than .05. Non-straight new fathers were associated with a higher risk of PPD. Father's sexual orientation could have a weak size effect on PPD (Cramer's V =.196).

The P-value of whether participants have been employed full-time (40+hours a week) (χ^2=4.861, p=.027) was less than .05, which indicated that there was a statistically significant difference on paternal PPD between whether participants have been employed full-time. Not being employed full-time was associated with a higher risk of PPD for participants. Whether participants have been employed full-time could have a weak size effect on PPD (Cramer's V=.154).

There was a statistically significant difference on paternal PPD among participant's ability to pay rent. Fathers who are worried about paying rent for next months were associated

with a higher risk of PPD. Whether participants worried about paying rent for next months could have a moderate size effect on PPD. (χ^2=25.130, p=.000<.05, Cramer's V =.350)

This study also found that if the infant's father's partner was diagnosed with PPD, the fathers were associated with a higher risk of PPD. Whether participant's partner has been diagnosed with PPD could have a moderate size effect on PPD. (χ^2=25.515, p=.000<.05, Cramer's V =.353).

Last but not least, there was a statistically significant difference on paternal PPD among whether participant's relationship with their partner has been changed because of the birth of their infant. If the relationship between the new father and their partner has been changed because of the infant was associated with a higher risk of PPD. Whether participant's relationship with their partner has been changed because of the birth of their infant could have a strong size effect on PPD. (χ^2=34.982, p=.000<.05, Cramer's V =.413)

In this group of samples, the ethnicity with the largest number of participants was Asian. 52.94% of participants were Asian(n=204). Most of the participants (44.12%) were Catholicism/Christianity, followed by Hinduism, which 40.67% of participants believed (n=204). 62.75% of participants hold a Bachelor's Degree and 28.92% hold a Master's Degree (n=204). During the COVID-19 pandemic, 66.83% of participants worked at home while 28.78% still need to go to workplace, and 9 people lay off due to COVID-19 pandemic(n=205). The majority of participants (91.71%) were married(n=205). (Table 3) Most (17.24%) of non-PPD father answered that their annual income in 2020 was between 30,001 and 40,000 (n=58), while most (20.41%) of PPD father's annual income in 2020 was between 20,001 and 30,000 (n=147). (Figure 6)

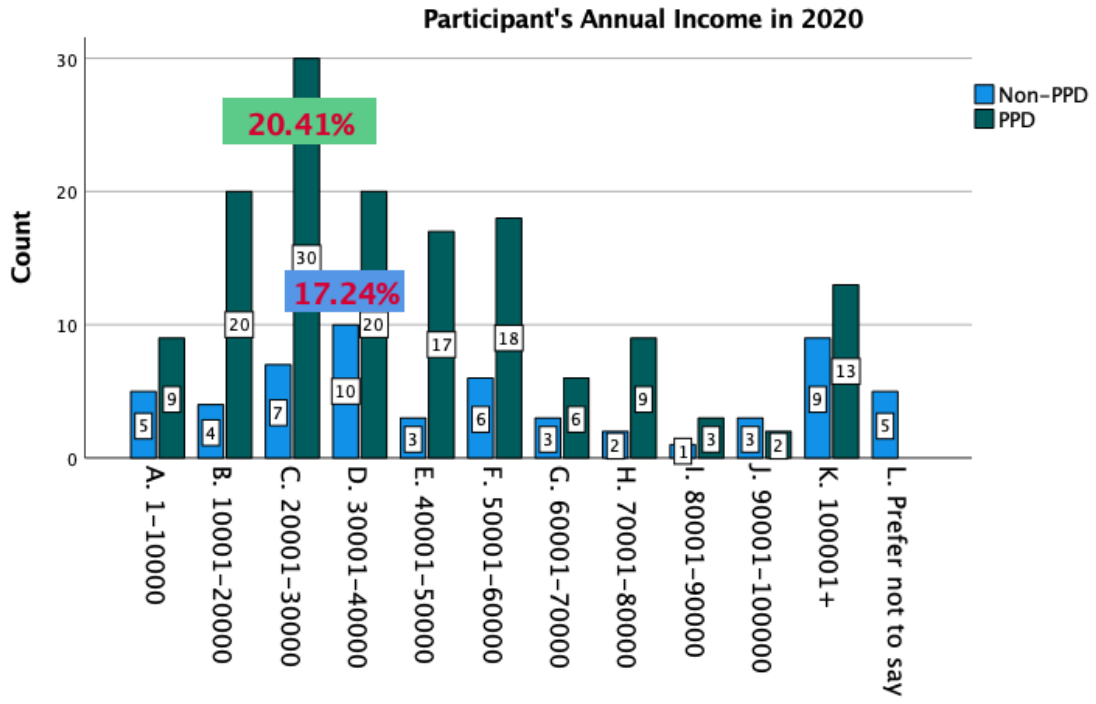

Figure 6 Participant's Annual Income in 2020

There were no statistically significant differences among the following demographic characteristics between PPD father group and non-PPD father group in this study. They were new father's ethnicity, religion, education, work status during the COVID-19 pandemic, and marital status.

Table 2 Demographic Characteristics-Significant Differences

n=205	PPD Father		Non-PPD Father		Total		df	p	Cramer's V
Age n=194	138		56		194	χ^2=12.105	2	.002	Cramer's V =.250 A weak to moderate size effect
• 20-29	53	38.4%	8	14.3%	61				
• 30-39	72	53.2%	37	66.1%	109				
• 40+	13	9.4%	11	19.6%	24				
Sexual Orientation n=204	146		58		204	χ^2=7.829	1	.005	Cramer's V =.196 A weak size effect
• Non-Heterosexual	42	28.8%	6	10.3%	48				
• Heterosexual	104	71.2%	52	89.7%	156				
Employment n=205	147		58		205	χ^2=4.861	1	.027	Cramer's V =.154 A weak size effect
• Employed Full-Time (40+hours a week)	115	78.2%	53	91.4%	168				
• Not Full-Time	32	21.8%	5	8.6%	37				
Father's Ability to Pay Rent n=205	147		58		205	χ^2=25.130	2	.000	Cramer's V =.350 A moderate size effect
• Yes, I'm afraid I can't pay the rent every month	67	45.6%	6	10.3%	73				
• No, I can pay the rent on time	49	33.3%	25	43.1%	74				
• No, I own my own house.	31	21.1%	27	46.6%	58				
Whether Participant's Partner has been Diagnosed with PPD	147		58		205	χ^2=25.515	1	.000	Cramer's V =.353 A moderate size effect
• Yes	77	52.4%	8	13.8%	85				
• No	70	47.6%	50	86.2%	120				
Whether Participant's Relationship with Their Partner has been Changed because of the Birth of Their Infants	147		58		205	χ^2=34.982	2	.000	Cramer's V =.413 A strong size effect
• Greatly change	48	32.7%	12	20.7%	60				
• Slightly change	86	58.5%	20	34.5%	106				
• No changes at all	13	8.8%	26	44.8%	39				

Table 3 Demographic Characteristics-No Significant Differences

n=205	PPD Father	Non-PPD Father	Total	A significant difference between PPD Father Group and Non-PPD Father Group
Ethnicity n=204	147	57	204	No 52.94% of participants were Asian
• Caucasian	36	20	56	
• African-American	11	2	13	
• Latino or Hispanic	10	7	17	
• Asian	80	28	108	
• Native American	7	0	7	
• Native Hawaiian or Pacific Islander	1	0	1	
• Two or More	1	0	1	
• Prefer not to say	1	0	1	
Religion n=204	147	57	204	No 44.12% of participants were Catholicism/Christianity
• Catholicism/Christianity	66	24	90	
• Judaism	2	1	3	
• Islam	6	4	10	
• Buddhism	4	1	5	
• Hinduism	62	21	83	
• Other	0	2	4	
• Prefer not to say	7	2	9	
Education n=204	147	57	204	No 62.75% of participants hold a Bachelor's Degree
• Less than a High School diploma	2	0	2	
• High School degree or equivalent	9	2	11	
• Bachelor's Degree	96	32	128	
• Master's Degree	37	22	59	
• Doctorate	3	1	4	
Work Status during the COVID-19 Pandemic n=205	147	58	205	No 66.83% of participants worked at home during the COVID-19 pandemic
• Work at home	97	40	137	
• Go to the workplace	44	15	59	
• Layoffs due to Covid-19 pandemic	6	3	9	
Current Marital Status n=205	147	58	205	No 91.71% of participants were married
• Single (never married)	5	2	7	
• Married	134	54	188	
• In a domestic partnership	7	2	9	
• Divorces	0	0	0	
• Widowed	1	0	1	

Factors Related to COVID-19 Pandemic

In this study, 31.98% of the participants were tested positive for COVID-19 (n=197).73.17% of participants (n=205) were worried about that they be infected with COVID-19 (Figure 7). And 74.63% of participants (n=205) in this study were worried that their infants would be infected with COVID-19. Compared with PPD fathers, non-PPD fathers were more likely not to worry about their infants being infected with COVID-19. 20.69% of non-PPD fathers(n=58) were not worried about their infants infected with COVID-19, while only 8.16% of PPD fathers (n=147) were not worried about that (Figure 8).

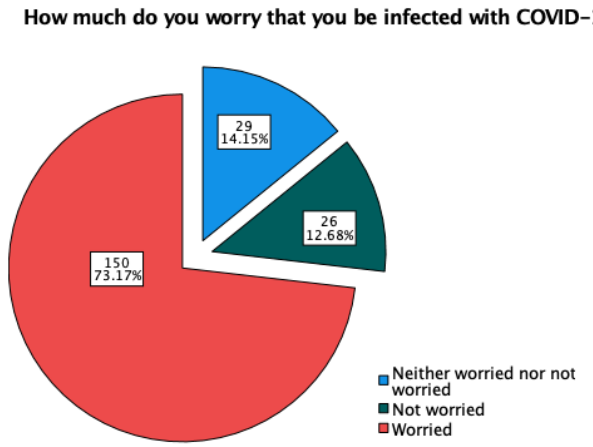

Figure 7 Worry about Self Being Infected with COVID-19

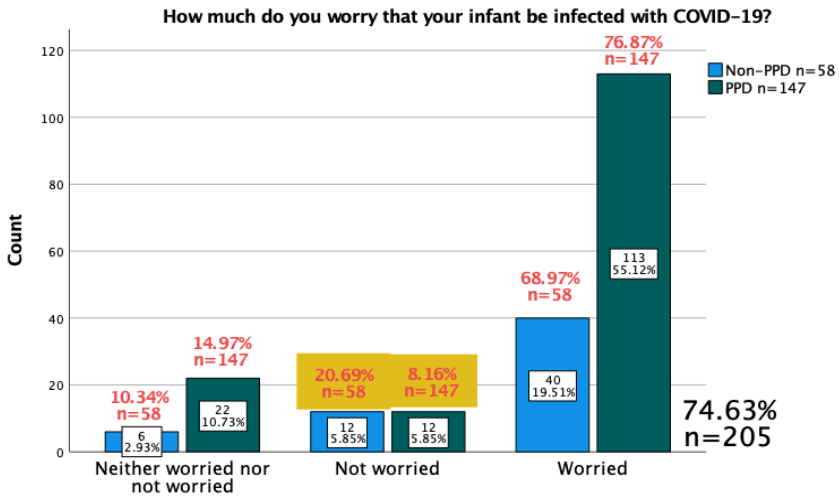

Figure 8 Worry about Infant Being Infected with COVID-19

When asked participants about the impact of covid-19 pandemic on them, most of the participants thought that COVID-19 pandemic negatively impacted them. Of the 205 people surveyed, 76.59% participants thought that their financial ability were negatively impacted by COVID-19 (n=205). 70.24% of participants were agreed with that their ability to seek help from their friends or other professionals were negatively impacted by COVID-19 (n=205). 81.47% of participants felt their social life were negatively impacted because of COVID-19 (n=205). As for mental health, 79.03% of participants thought it was negatively impacted by COVID-19 (n=205). However, 52.19% of the participants thought that COVID-19 positively influenced their experience of being a father by allowing them more time to spend with their infants (n=205). 89.8% of the participants agreed with that "Covid-19 allows participants to stay at home longer, participants could interact with their infants more, and they could get closer" (n=205). (Table 4)

In this group of participants, statistically significant differences between PPD father group and non-PPD father group were found among 1) participant's COVID-19 test results 2) whether participants have been hospitalized for COVID-19; 3) whether participants have been self-isolated for COVID-19; 4) whether participant's relationship with their partner has been changed because of COVID-19; 5) how participants thought COVID-19 impact their mental health. (Table 5)

Compared with P-value .05, P-value of PPD father group and non-PPD father group on COVID-19 test results (χ^2=14.308, p=.000) is less than .05. Therefore, there was a statistically significant difference on paternal PPD between different participants' COVID-19 test results. Being tested COVID-19 positive was associated with a higher risk of PPD. COVID-19 test results could have a weak to moderate size effect on PPD (Cramer's V =.270).

The risk of paternal PPD was different between whether participants have been hospitalized for COVID-19. P-value of PPD father group and non-PPD father group on whether participants have been hospitalized for COVID-19 (χ^2=21.182, p=.000) is less than .05. Being hospitalized for COVID-19 was associated with a higher risk of PPD. whether participants have been hospitalized for COVID-19 could have a moderate size effect on PPD (Cramer's V =.321).

The P-value of whether participants have been self-isolated for COVID-19 (χ^2=18.494, p=.000) was less than .05, which indicated that there was a statistically significant difference on paternal PPD between whether participants have been self-isolated for COVID-19. Being self-isolated during COVID-19 was associated with a higher risk of PPD. Whether participants have been self-isolated for COVID-19 could have a moderate size effect on PPD (Cramer's V =.3).

79.02% of participants in this study were either very satisfied or satisfied with their relationship with their partner during the COVID-19 pandemic(n=205). Non-PPD fathers were more likely to be very satisfied with their relationship with their partners than PPD fathers during the COVID-19 pandemic. 46.55% of non-PPD fathers (n=58) were very satisfied with their relationship with their partners, while only 19.05% of PPD fathers (n=147) were very satisfied with their relationship with their partners (Figure 9). There was a statistically significant difference on whether participant's relationship with their partner has been changed because of COVID-19. The relationship between the new father and their partner has been changed because of COVID-19 was associated with a higher risk of paternal PPD. whether participant's relationship with their partner has been changed because of COVID-19 could have a moderate to strong size effect on PPD. (χ^2=37.399, p=.000<.05, Cramer's V =.427)

This study also found that there was a statistically significant difference on how PPD fathers and non-PPD fathers feel about COVID-19's impact on their mental health. Participants

thought COVID-19 negatively impact their mental health were associated with a higher risk of PPD. How participants thought COVID-19 impact their mental health could have a weak size effect on PPD. (χ^2=3.871, p=.049<.05, Cramer's V =.137)

Table 4 Factors Impacted by COVID-19

How COVID-19 impacts …	Extremely Negative Impact	Negative Impact	Slightly Negative Impact	Slightly Positive Impact	Positive Impact	Extremely Positive Impact	A significant difference between Father with PPD and Father without PPD
Experience of Being a Father	8.78%	19.51%	19.51%	27.80%	19.51%	4.88%	No
				52.19%			
	89.8% of the participants agreed with that "Covid-19 allows participants to stay at home longer, participants could interact with their infant more, and they could get closer"						No
Financial Ability	15.12%	32.2%	29.27%	13.17%	8.29%	1.95%	No
	76.59%						
Social Life	24.88%	32.20%	24.39%	12.20%	5.85%	0.49%	No
	81.47%						
Ability to Ask for Help	12.68%	25.85%	31.71%	17.07%	10.73%	1.95%	No
	70.24%						
Mental Health	8.78%	36.10%	34.15%	12.68%	7.80%	0.49%	Yes p=.049
	79.03%						

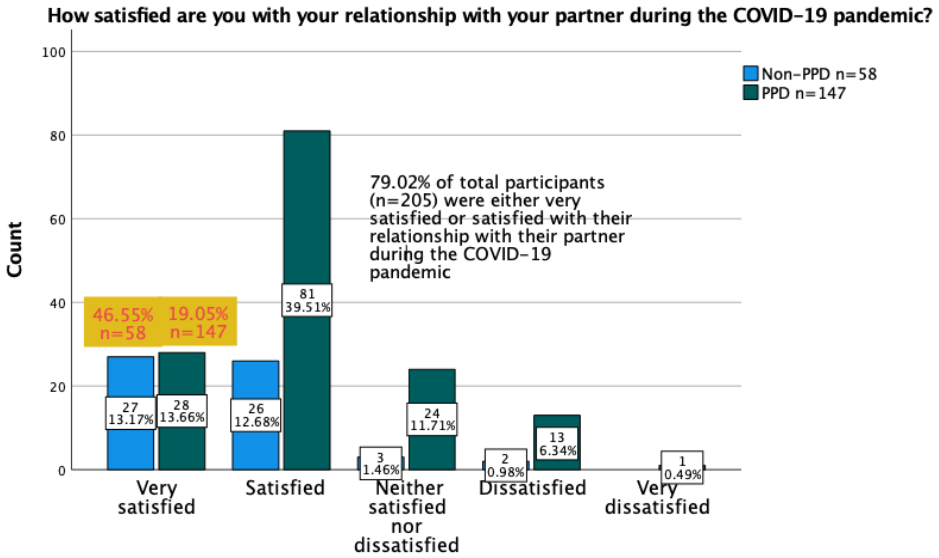

Figure 9 Satisfaction with their partner during COVID-19

Table 5 Factors Related to COVID-19-PPD Group V.S. Non-PPD Group

n=205	PPD Father		Non-PPD Father		Total		df	p	Cramer's V
COVID-19 Test Results n=197	140		57		197	χ^2=14.308	1	.000	Cramer's V =.270 A weak to moderate size effect
• Positive	56	40%	7	12.3%	63				
• Negative	84	60%	50	87.7%	134				
Whether Participant been Hospitalized for COVID-19	147		58		205	χ^2=21.182	1	.000	Cramer's V =.321 A moderate size effect
• Yes	51	34.7%	2	3.4%	53				
• No	96	65.3%	56	96.6%	152				
Whether Participants have been Self-isolated	147		58		205	χ^2=18.494	1	.000	Cramer's V =.3 A moderate size effect
• Yes	92	62.6%	17	29.3%	109				
• No	55	37.4%	41	70.7%	96				
Whether Participant's Relationship with Their Partner has been Changed because of COVID-19	147		58		205	χ^2=37.399	2	.000	Cramer's V =.427 A moderate to strong size effect
• Greatly change	39	26.5%	9	15.5%	48				
• Slightly change	86	58.5%	16	27.6%	102				
• No changes at all	22	15%	33	56.9%	55				
COVID-19 Impact on Mental Health	147		58		205	χ^2=3.871	1	.049	Cramer's V =.137 A weak size effect
• Positive impact	36	24.5%	7	12.1%	43				
• Negative impact	111	75.5%	51	87.9%	162				

Chapter 4 Conclusions and Recommendations

Summary of Findings

In this study, there were statistically significant differences between PPD father group and non-PPD father group among 1) participant's age; 2) participant's sexual orientation; 3) whether participants have been employed full-time (40+hours a week); 4) participant's ability to pay rent; 5) whether participant's partner has been diagnosed with PPD; 6) whether participant's relationship with their partner has been changed because of the birth of their infant.

Among demographic characteristics, the higher risk of father experiencing PPD was associated with father's younger age, father's non-heterosexual sexual orientation, fathers have not been employed full-time, fathers do not have the ability to pay rent, father's partner has PPD, father's relationship with their partner has been changed because of the birth of their infant.

More than 70% of fathers in this study believed that COVID-19 negatively impacted their financial ability, social life, ability to ask for help, and mental health. However, in the aspect of the experience of being a father, most of the participants thought that COVID-19 had a positive influence on them. Many fathers agreed that COVID-19 enables them to interact with their infants more and get closer with each other.

When asking this group of participants about questions about COVID-19 pandemic, statistically significant differences between PPD father group and non-PPD father group were found among 1) participant's COVID-19 test results 2) whether participants have been hospitalized for COVID-19; 3) whether participants have been self-isolated for COVID-19; 4) whether participant's relationship with their partner has been changed because of COVID-19; 5) how participants thought COVID-19 impact their mental health.

Among the factors related to COVID-19, the father who was tested COVID-19 positive, being hospitalized, being self-isolated, father's relationship with their partner has been changed because of COVID-19, participants thought COVID-19 had a negative impact on their mental health were all respectively associated with a higher risk of PPD.

Social Work Implications

People's awareness of paternal PPD is far from enough. Many people don't know that new fathers could also suffer from PPD. Social workers should be more active in popularizing the concept of paternal PPD and let more people realize the existence of paternal PPD. Paternal PPD not only lead by some ecological changes, such as changes of role and lifestyle (Baldwin et al., 2018) but also more prone to fathers who affected by some biological factors, such as previous depression history (Ayinde & Lasebikan, 2019) and hormonal changes (Kim & Swain, 2007). Paternal PPD is a mental illness and it needs professionals help and intervention. In this study, according to participants' EPDS scores, 71.71% of participants experienced paternal PPD, which is much higher than pervious study. In real life, many paternal PPD cases may be underreported. Moreover, due to the stigma of mental illness, men are less likely to seek help from the outside. Nearly 1 in 10 men experience depression and anxiety, but less than half sought treatment (Blumberg et al., 2015), which means that many fathers experiencing PPD may not get help. Therefore, social workers should pay more attention to paternal PPD, and provide more help to fathers who suffer from PPD, and continue to advocate for PPD fathers. When social workers help an infant's father, social workers should check whether the father is experiencing PPD. Social workers should be more alert when clients have high-risk factors associated with PPD, which are mentioned in this study. And as social workers, we should always continue to practice one of our missions, eliminating mental illness stigma.

During the COVID-19 pandemic, the prevalence of depression symptoms was more than 3-fold higher than before (Ettman et al., 2020). In this study, when asked participants about the impact of COVID-19 pandemic on them, most of the participants thought that COVID-19 pandemic negatively impacted their financial ability, social life, ability to seek help from their friends or other professionals, and mental health. However, 52.19% of the participants thought that COVID-19 positively influenced their experience of being a father by allowing them more time to spend with their infant. Although COVID-19 brings many negative effects, social workers should try our best to help clients explore the positive influence of COVID-19 pandemic.

When the researcher conducted this study, the researcher found that compared with other social work topics, there were relatively few studies on paternal PPD. Therefore, social work researchers should conduct more research on paternal PPD and keep educating ourselves about paternal PPD.

Limitations

This study is based on the best knowledge of the researcher. However, the researcher is an undergraduate student, and it is the researcher's first-time doing research. Therefore, the researcher may need more learning and experience.

The number of samples in this study is relatively small, only 205 valid samples, in order to make the research results more universal, more study samples are needed. Besides, the number of non-PPD fathers in this study is relatively small, compared with PPD fathers, accounting for only 28.29% of the total number of participants (n=205). This study needs to recruit more non-PPD fathers.

In addition, there may be selective bias when getting samples in this study. Researcher published study's survey on Amazon Mechanical Turk. Participants can voluntarily choose to participate in this study or not. People who are interested in the topic of paternal PPD, or who consider that they may experience PPD, may be more likely to participate in this study.

The results of the survey were based on the participants' self-report. Because of each person's character and their different measures, there may be threats to internal validity. In particular, the EPDS is a self-report measurement and may not be considered as reliable as a structured psychiatric diagnosis. In this study, fathers considered experiencing PPD may need further evaluation with their healthcare providers. However, the Edmondson et al. study shows 89.5% sensitivity and 78.2% specificity for the cutoff of 10 in men (2010). Therefore, EPDS could be used to evaluate whether an infant father has paternal PPD.

Furthermore, because the participants of this study come from all over the world, each country are different, and the extent of being impacted by COVID-19 is different, so we need to consider the influence of culture and other factors on this study.

Conclusions

In recent years, more and more attention has been paid to maternal postpartum depression, but many people do not know that new fathers are also at risk of postpartum depression. With infants' birth, many factors such as the changes of role and lifestyle could make infant fathers feel stress, fear, and have negative feelings (Baldwin et al., 2018). Fathers experiencing PPD may be more likely to withdraw from social situations or appear irritable and indecisive (Letourneau et al., 2012). Paternal PPD not only directly affects the mental health and well-being of infant fathers but also affects the function of the whole family, children, and father's partner in the family (Kim & Swain, 2007; Letourneau et al., 2012).

Findings of the study showed that father's younger age, father's non-heterosexual sexual orientation, fathers have not been employed full-time, fathers do not have the ability to pay rent, father's partner has PPD, father's relationship with their partner has been changed because of the birth of their infant were all respectively associated with a higher risk of paternal PPD.

Among the factors related to COVID-19, the father who was tested COVID-19 positive, being hospitalized, being self-isolated, father's relationship with their partner has been changed because of COVID-19, COVID-19 had a negative impact on their mental health were also associated with a higher risk of PPD.

Most of the participants in this study thought that COVID-19 pandemic negatively impacted their financial ability, social life, ability to seek help, and mental health. However, 52.19% of the participants thought that COVID-19 positively influenced their experience of being a father by allowing them more time to spend with their infant.

When social workers help the infant's father, social workers should check whether the father is experiencing PPD, especially when new fathers have high-risk factors associated with PPD, which are mentioned in this study and help clients explore the positive impact of COVID-19. Also, social workers should be more active in advocating for fathers experiencing PPD and conducting more research on paternal PPD. This study is dedicated to fathers experiencing paternal postpartum depression and their families. Hope to help more fathers with PPD in the future.

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Appendices

Appendix 1 IRB Exempt Approval

Study Determined Exempt for #2021E0098

Buck-IRB <irbinfo@osu.edu>
Fri 1/29/2021 15:03

To: Lee, Mo-Yee <lee.355@osu.edu>
Cc: yu.2653@osu.edu <yu.2653@osu.edu>

THE OHIO STATE UNIVERSITY

Office of Responsible Research Practices

300 Research Administration building
1960 Kenny Road
Columbus, OH 43210-1063

orrp.osu.edu

01/29/2021

Study Number: 2021E0098
Study Title: Comparison of Demographic Data between Fathers with and without Paternal Postpartum Depression, Especially during the Covid-19 Pandemic Copy

Principal investigator: Mo-Yee Lee
Date of determination: 01/29/2021

Qualifying exempt category: #2a

Dear Mo-Yee Lee,

The Office of Responsible Research Practices has determined the above referenced project exempt from IRB review.

Administrative Note:

- As the university moves to a staged approach to restarting research activities, refer to Human Subjects Guidance and FAQs. If after reviewing this information and working through your college you have additional questions, please direct emails to research@osu.edu.

Please note the following about this determination:

- Retain a copy of this correspondence for your records.
- Only the Ohio State staff and students named on the application are approved as Ohio State investigators and/or key personnel for this study.
- Simple changes to personnel that do not require changes to materials can be submitted

Appendix 2 Study Consent

The Ohio State University Consent to Participate in Research

Study Title:	Comparison of Demographic Data between Fathers with and without Paternal Postpartum Depression, Especially during the Covid-19 Pandemic
Protocol Number:	2021E0098
Researcher:	Mo-Yee Lee; Yunzi Yu
Sponsor:	None

This is a consent form for research participation. It contains important information about this study and what to expect if you decide to participate.

Your participation is voluntary.

Please consider the information carefully. Feel free to ask questions before making your decision whether or not to participate.

Purpose:
This study designs to explore the differences in fathers' demographic data with and without paternal postpartum depression, especially during the current COVID-19 pandemic.

Procedures/Tasks:
To be eligible to participate in this study, the participants are required to meet the following three criteria: 1) participants considered themselves to be male and they are at least 18 years old 2) participants are in a heterosexual relationship 3) participants need to be a father of a newborn born after March 1st 2020 and their newborns will less than one year old when they fill out the survey. Participants will be given an online survey, which will include three parts. The first part of the survey is the Edinburgh Postnatal Depression Scale. The second part of the survey will ask all fathers' demographic data, including age, ethnicity, etc. The third part of the survey will ask how much fathers are affected by the COVID-19 pandemic, such as changes in financial ability and social life.

Duration:
You may leave the study at any time. If you decide to stop participating in the study, there will be no penalty to you, and you will not lose any benefits to which you are otherwise entitled. Your decision will not affect your future relationship with The Ohio State University.

Risks and Benefits:
There is no obvious foreseeable risk.
This study can help find the risk factors of Paternal Postpartum Depression (PPD) and prevent paternal PPD in the future. Participants who complete the online survey will also receive a $0.50 reward through Amazon MTurk.

Confidentiality:
We will work to make sure that no one sees your online responses without approval. But, because we are using the Internet, there is a chance that someone could access your online responses without permission. In some cases, this information could be used to identify you.

Also, there may be circumstances where this information must be released. For example, personal information regarding your participation in this study may be disclosed if required by state law. Also, your records may be reviewed by the following groups (as applicable to the research):

Office for Human Research Protections or other federal, state, or international regulatory agencies;

The Ohio State University Institutional Review Board or Office of Responsible Research Practices;

The sponsor, if any, or agency (including the Food and Drug Administration for FDA-regulated research) supporting the study.

Future Research:
Your de-identified information will not be used or shared with other researchers.

Incentives:
By law, payments to participants are considered taxable income.

Participant Rights:
You may refuse to participate in this study without penalty or loss of benefits to which you are otherwise entitled. If you are a student or employee at Ohio State, your decision will not affect your grades or employment status.

If you choose to participate in the study, you may discontinue participation at any time without penalty or loss of benefits. By agreeing to participate, you do not give up any personal legal rights you may have as a participant in this study.

This study has been determined Exempt from IRB review.

Contacts and Questions:
For questions, concerns, or complaints about the study you may contact Yunzi Yu at 614-377-5021 or yu.2653@osu.edu.

For questions about your rights as a participant in this study or to discuss other study-related concerns or complaints with someone who is not part of the research team, you may contact the Office of Responsible Research Practices at 1-800-678-6251 or hsconcerns@osu.edu.

Providing consent
I have read (or someone has read to me) this page and I am aware that I am being asked to participate in a research study. I have had the opportunity to ask questions and have had them answered to my satisfaction. I voluntarily agree to participate in this study. I am not giving up any legal rights by agreeing to participate. Clicking "I consent" below indicates that I considered myself to be male; I am at least 18 years old; I am in a heterosexual relationship; I am a father of a newborn born after March 1st, 2020; and my newborn will less than one year old when I fill out the survey.

To print or save a copy of this page, select the print button on your web browser.

Please click the button below to proceed and participate in this study. If you do not wish to participate, please close out your browser window.

Appendix 3 Study Survey

Comparison of Demographic Data between Fathers with and without Paternal Postpartum Depression, Especially during the Covid-19 Pandemic

Part 1 Edinburgh Postnatal Depression Scale (EPDS)

1. Have you ever had a history of mental illness?

   A. Yes (If you would, please specify_____)
   B. No

2. Have you ever had generalized anxiety disorder (GAD)?

   A. Yes
   B. No

3. I have been able to laugh and see the funny side of things

   0 As much as I always could

   1Not quite so much now

   2 Definitely not so much now

   3 Not at all

4. I have looked forward with enjoyment to things

   0 As much as I ever did

   1 Rather less than I used to

   2 Definitely less than I used to

   3 Hardly at all

5. I have blamed myself unnecessarily when things went wrong

   3 Yes, most of the time

   2 Yes, some of the time

1 Not very often

0 No, never

6. I have been anxious or worried for no good reason

0 No, not at all

1 Hardly ever

2 Yes, sometimes

3 Yes, very often

7. I have felt scared or panicky for no very good reason

3 Yes, quite a lot

2 Yes, sometimes

1 No, not much

0 No, not at all

8. Things have been getting on top of me

3 Yes, most of the time I haven't been able to cope

2 Yes, sometimes I haven't been coping as well as usual

1 No, most of the time I have coped quite well

0 No, I have been coping as well as ever

9. I have been so unhappy that I have had difficulty sleeping

3 Yes, most of the time

2 Yes, sometimes

1 Not very often

0 No, not at all

10. I have felt sad or miserable

3 Yes, most of the time

2 Yes, quite often

1 Not very often

0 No, not at all

11. I have been so unhappy that I have been crying

3 Yes, most of the time

2 Yes, quite often

1 Only occasionally

0 No, never

12. The thought of harming myself has occurred to me

3 Yes, quite often

2 Sometimes

1 Hardly ever

0 Never

Part 2 Demographics questions

1. What year were you born? _____
2. How old were you when you had your first child? _____
3. How old is your latest newborn?

    A. One-month-old
    B. Two-month-old
    C. Three-month-old
    D. Four-month-old
    E. Five-month-old
    F. Six-month-old
    G. Seven-month-old
    H. Eight-month-old
    I. Nine-month-old
    J. Ten-month-old
    K. Eleven-month-old
    L. 1-year-old

4. What is the order of the most recent newborns?

    A. This is my first child
    B. This is my second child
    C. This is my third child
    D. Other (please specify) _____

5. What gender identity/expression you most identify with?

    A. Female
    B. Male
    C. Transgender female
    D. Transgender male
    E. Gender variant/Non-conforming
    F. Not List (please specify) _____
    G. Prefer not to say

6. Please select the option that best describes your sexual orientation:

    A. Bisexual
    B. Gay or Lesbian
    C. Heterosexual or Straight
    D. Not list or other

7. Please specify your ethnicity

    A. Caucasian
    B. African-American
    C. Latino or Hispanic
    D. Asian
    E. Native American
    F. Native Hawaiian or Pacific Islander
    G. Two or More
    H. Other/Unknown
    I. Prefer not to say

8. If applicable, please specify your religion.

    A. Catholicism/Christianity
    B. Judaism
    C. Islam
    D. Buddhism
    E. Hinduism
    F. Other: _____
    G. Prefer not to say

9. What is the highest degree or level of education you have completed?

    A. less than a High School diploma
    B. High School degree or equivalent
    C. Bachelor's Degree
    D. Master's Degree
    E. Doctorate
    F. Other (please specify) _____
    G. Prefer not to say

10. What is your current employment status?

    A. Employed Full-Time (40+hours a week)
    B. Employed Part-Time (less than 40 hours a week)
    C. Unemployed (currently looking for opportunities)
    D. Unemployed (not currently looking for opportunities)
    E. Student
    F. Retired
    G. Self-employed
    H. Disabled, not able to work

11. What is your work status during the COVID-19 pandemic?
    A. Work at home
    B. Go to the workplace
    C. Layoffs due to COVID-19 pandemic
    D. Other (please specify _____)

12. What is your approximate annual income in 2020?

    A. 1-10000
    B. 10001-20000
    C. 20001-30000
    D. 30001-40000
    E. 40001-50000
    F. 50001-60000
    G. 60001-70000
    H. 70001-80000
    I. 80001-90000
    J. 90001-100000
    K. 100001+
    L. Prefer not to say

13. Are you worried about the rent of your house?

    A. Yes, I'm afraid I can't pay the rent every month
    B. No, I can pay the rent on time

C. No, I own my own house.

14. What is your current marital status?

A. Single (never married)
B. Married
C. In a domestic partnership
D. Divorces
E. Widowed

15. Is your partner diagnosed with postpartum depression?

A. Yes
B. No

16. Before Covid-19 (before March 1st), how do you considerate your physical health?

A. Very good
B. Good
C. Neither good or bad
D. Bad
E. Very bad

17. Before Covid-19 (before March 1st), how do you considerate your mental health?

A. Very good
B. Good
C. Neither good or bad
D. Bad
E. Very bad

Part 3 Questions about COVID-19 Pandemic

18. Have you been tested positive of Covid-19?

A. Yes
B. NO
C. Unsure

19. From 0 to 5, how would you describe the severity of your Covid-19 symptoms?

A. 0 (No Symptom)
B. 1
C. 2
D. 3
E. 4

F. 5 (Extremely Severe)

20. Have you ever been hospitalized for Covid-19?

    A. Yes
    B. No

21. Have you been self-isolated?

    A. Yes
    B. No

22. How satisfied are you with your relationship with your partner during the covid-19 pandemic?

    A. Very satisfied
    B. Satisfied
    C. Neither satisfied nor dissatisfied
    D. dissatisfied
    E. Very dissatisfied

23. How much do you think your relationship with your partner has changed because of the birth of your newborn?

    A. Greatly change
    B. Slightly change
    C. No changes at all

24. How much do you think your relationship with your partner has changed because of the Covid-19 pandemic?

    A. Greatly change
    B. Slightly change
    C. No changes at all

25. How much do you agree with the following sentence: “Covid-19 allows me to stay at home longer, I could interact with my newborn more, and we could get closer”?

    A. Very agree
    B. Slightly agree
    C. Slightly disagree
    D. Very disagree

26. How much do you worry that you may be infected with covid-19?

    A. Extremely worried

B. Slightly worried
C. Neither worried nor not worried
D. Slightly not worried
E. Extremely not worried

27. How much do you worry that your newborn may be infected with covid-19?

A. Extremely worried
B. Slightly worried
C. Neither worried nor not worried
D. Slightly not worried
E. Extremely not worried

28. How much do you think covid-19 affects your financial ability?

A. Extremely negative impact
B. negative impact
C. Slightly negative impact
D. Slightly positive impact
E. Positive impact
F. Extremely positive impact

29. How much do you think covid-19 affects your social life?

A. Extremely negative impact
B. negative impact
C. Slightly negative impact
D. Slightly positive impact
E. Positive impact
F. Extremely positive impact

30. How much do you think covid-19 affects your overall mental health?

A. Extremely negative impact
B. negative impact
C. Slightly negative impact
D. Slightly positive impact
E. Positive impact
F. Extremely positive impact

31. How much do you think covid-19 affects your ability to ask for help from your friends or other professionals?

A. Extremely negative impact
B. negative impact
C. Slightly negative impact

D. Slightly positive impact
E. Positive impact
F. Extremely positive impact

32. How much do you think covid-19 affects your experience of being a father?

A. Extremely negative impact
B. negative impact
C. Slightly negative impact
D. Slightly positive impact
E. Positive impact
F. Extremely positive impact